From: Johnson, Trena N CTR ONR, BDCSC
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THURSDAY, 13 DECEMBER, 2018

EXTERNAL NEWS STORIES

1. US diplomats in Cuba suffered inner-ear damage after experiencing mysterious sound or pressure, doctors say (sandhillsexpress.com)

(MIAMI) — U.S. diplomatic personnel residing in Cuba's capital who felt ill after hearing loud, high-pitched sounds or feeling pressure sensations suffered damage to a part of the inner ear responsible for maintaining balance, according to a study by the doctors who first treated them.

Beginning in the fall of 2016, more than two dozen American government employees posted at the U.S. embassy in Havana reported neurological, cognitive and emotional issues following exposure to an unknown, directed energy source inside their homes, according to physicians at the University of Miami who examined the patients and revealed their findings in a scientific paper published Wednesday in the journal Laryngoscope Investigative Otolaryngology.

[Dr. Carey Balaban is a professor of otolaryngology at the University of Pittsburgh School of Medicine who contributed to the study]. Balaban, the only professor on the study not from the University of Miami Miller School of Medicine, said he's currently doing a study sponsored by the Office of Naval Research to "try and get an idea of what are likely possibilities."

URL:
http://sandhillsexpress.com/abc_health/us-diplomats-in-cuba-suffered-innerear-damage-after-experiencing-mysterious-sound-or-pressure-doctors-say-abcid36139348/

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2. University of Miami Medical Team Reports Acute Findings from the Havana Embassy Phenomenon (med.miami.edu) [Dr. Kurt Yankaskas is quoted].

A team of University of Miami Miller School of Medicine faculty, along with collaborators from the University of Pittsburgh, today presented the first report of acute symptoms and clinical findings in 25 diplomatic personnel living in the U.S. Embassy in Havana, Cuba, who experienced severe neurosensory symptoms after exposure to a unique sound and pressure phenomenon.

"Objective testing showed evidence of a balance disorder that affects the inner ear and a unique pattern of cognitive and behavioral dysfunction," said Michael E. Hoffer, M.D., professor of otolaryngology and neurological surgery. "This cluster of auditory and neurological symptoms, along with associated psychological issues, does not resemble more classic traumatic brain injury (TBI) based on our team's vast experience in this area."

In their study, the authors recognized Kurt Yankaskas, program manager at the Office of Naval Research, for comments helping to clarify the work; Alexander Kiderman, Ph.D., chief technology officer at NKI, for designing the software and hardware used to analyze these patients; Constanza Pelusso, M.D., research director in the Department of Otolaryngology, for her help in filing all necessary patient research forms and reports; and Danierys

Font for her assistance in scheduling all of the patients.

URL:
http://med.miami.edu/news/university-of-miami-medical-team-reports-acute-findings-from-the-havana-emb

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3. Radicalism and Cultural Homelessness (minerva.defense.gov)

Dec. 12, 2018 — Events like the 2015 Paris attacks, the 2015 San Bernardino shootings, the 2016 Orlando Pulse Nightclub shooting, the 2013 Boston Marathon bombing, and others since are seared into our memories. While many details of these attacks were different, they do have a striking commonality: these attacks were perpetrated by immigrant residents or citizens of the targeted country. Such tragedies raise a puzzling question: what would make someone turn against their own country?

With violent extremist groups like ISIS recruiting Muslims in the West in alarming numbers, this is a question of both theoretical and practical importance that we sought to answer through our own research, published in Behavioral Science and Policy. In a survey of 198 Muslims in the United States, participants were asked about their experiences as religious and cultural minorities, including their feelings of exclusion or discrimination on the basis of their religion. We also asked how they balanced their heritage identities with their American identities in order to see if these kinds of experiences were related to their feelings toward radical groups and causes.

Supporting Service Agency: Office of Naval Research

URL:
https://minerva.defense.gov/Owl-In-the-Olive-Tree/Owl_View/Article/1706681/radicalism-and-cultural-homelessness/

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4. This unusual nature-inspired robot is equally at home on land or in the water (digitaltrends.com)

Biomimicry, the concept of modellng systems found in nature to solve complex problems, is popular among roboticists. But while the robots that result from it can gain the strengths of particular forms of animal locomotion or other abilities, they also adopt the species' same limitations. For example, an aquatic fish-inspired swimming robot may be really adept at moving in water, but it's probably not going to be too effective on dry land. Because, you know, it's based on a fish.

That's where an intriguing new robot created by the company Pliant Energy Systems switches things up. Not only is it pretty darn effective at maneuvering underwater, using a pair of servo-assisted silicone fins, but it can also turn these fins into "legs" to continue to travel while out of the pool. Heck, it can even move effectively on ice: A particularly tough surface for virtually anything to move on.

Velox is intended as a proof-of-concept demonstration platform. The work is supported by the U.S. Office of Naval Research, which is interested in exploring the potential of different types of robot. However, Filardo said that Pliant has commercialization in mind and is currently exploring potential partners.

URL:
https://www.digitaltrends.com/cool-tech/pliant-velox-robot-water-land/

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5. How Mobility Solutions Are Transforming Military Tactical Operations & Driving Better Mission Outcomes (insights.samsung.com) [Command Master Chief Matt Matteson is quoted].

Tactical teams and special operators face formidable challenges in an increasingly distributed battlefield — including complex terrain, long engagement ranges between troops, and loss of communication with Command. In

environments where adversaries and operational environments evolve quickly and every second counts, military personnel success and survival require situational awareness during all phases of the mission.

As a result, operators are relying more and more on the power of mobility solutions to make informed decisions that impact mission success. Mobile technologies are transforming mission operations in the tactical environment by providing seamless communication capabilities for less cost with a bigger impact on the battlefield.

According to the Office of Naval Research (ONR)'s Command Master Chief Matt Matteson, this capability can deliver clear battlefield advantage: "Because the KILSWITCH surface danger zone (SDZ) tool is handheld and portable, service members can plan live-fire training while in the field versus from inside of a command center. They're able to walk the ground and see graphic representations of weaponry, which improves planning efficiency — especially when plans change suddenly."

URL:
https://insights.samsung.com/2018/12/13/how-mobility-solutions-are-transforming-military-tactical-operations-driving-better-mission-outcomes/

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FULL TEXT MEDIA CLIPS

EXTERNAL NEWS STORIES

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(MIAMI) — U.S. diplomatic personnel residing in Cuba's capital who felt ill after hearing loud, high-pitched sounds or feeling pressure sensations suffered damage to a part of the inner ear responsible for maintaining balance, according to a study by the doctors who first treated them.

Beginning in the fall of 2016, more than two dozen American government employees posted at the U.S. embassy in Havana reported neurological, cognitive and emotional issues following exposure to an unknown, directed energy source inside their homes, according to physicians at the University of Miami who examined the patients and revealed their findings in a scientific paper published Wednesday in the journal Laryngoscope Investigative Otolaryngology.

"Objective testing showed evidence of a balance disorder that affects the inner ear and a unique pattern of cognitive and behavioral dysfunction," Dr. Michael Hoffer, the lead author of the study, said in a press release.

The patients complained of intense ear pain, hearing loss, headaches, dizziness and difficulty with balance, as well as increased anxiety and irritability, doctors found, but who or what caused the damage is still unknown.

"The possible sources and the medical findings we have here do not have a quick or easy solution," said Dr. Carey Balaban, a professor of otolaryngology at the University of Pittsburgh School of Medicine who contributed to the study. "I wish someone could tell us that right now. I wish we'd have that."

The study is the first to look at patients as soon as four days after they were exposed to sounds or pressure — a time period described as the "acute presentation" of symptoms, meaning very soon after they began to show. The study examined 25 people with symptoms and 10 people who were their roommates but did not have any symptoms.

Wednesday's paper differed from a study published in February by a team of doctors at the University of Pennsylvania, which found patients may have suffered "a possible acquired brain injury."

The study released Wednesday found the symptoms didn't resemble "more classic traumatic brain injury," but did find there was injury to the ears that affected the brain.

The authors of this latest study also emphasized that it further showed that the patients' symptoms weren't stemming

from their imaginations or caused by anxieties.

Balaban described it as “measurable, quantifiable evidence that something really did happen.”

“It’s not just hysteria,” Balaban added.

Hoffer, who served for 21 years in the military and has experience in blast trauma, highlighted the ways the study, and the situation, are unique.

“I never even got this phone call when I was in the military, and the phone call was: ‘This is the State Department, we have a problem,'” Hoffer said in a press conference in Miami on Wednesday.

A State Department spokesperson told ABC News that while it has “welcomed any clinical publication that would help the scientific community better understand what may have caused the observed symptoms” it was not informed about this study’s publication.

“The State Department reviewed, cleared, and in February 2018 informed Dr. Hoffer that it had no objection to his proposed New England Journal of Medicine article,” the spokesperson said. “With regard to his Laryngoscope Investigative Otolaryngology article, the Department was not informed of nor aware of this publication. The Department did not authorize or clear on this study.”

But Hoffer told reporters Wednesday that the State Department “saw the study, they cleared the study, they had to clear the study. In fact, the study spent nine months in the state department getting cleared to make sure it didn’t have any classified information in it.”

The source of the localized noise or pressure sensation that caused the symptoms has not been determined, though the study found it would be “imprudent to exclude any potential directed or non-directed energy sources at this time.”

“We have incontrovertible objective evidence that they had an abnormality when they represented acutely,” Hoffer said. “What caused it, who did it, why it was done, we don’t know any of those things.”

Hoffer acknowledged frustrations with the lack of answers but said studies were ongoing.

“I think its vexing for all Americans, all people around the world, that people can be harmed and not know why. But we have to let the science play out,” he said.

Balaban, the only professor on the study not from the University of Miami Miller School of Medicine, said he’s currently doing a study sponsored by the Office of Naval Research to “try and get an idea of what are likely possibilities.”

“I want to make it imminently clear that we don’t know what they were exposed to and certainly can’t make any inferences as to whether it was deliberate or inadvertent — no idea,” Balaban said of the patients.

According to Balaban, there are a number of easily purchased items that could be used, like pest-control devices, and there have been other examples of biological exposure or directed energy that could cause such symptoms.

“These are in the safe range but it shows you the technology is there and could be placed inside a room that could do such a thing,” Balaban said.

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http://sandhillsexpress.com/abc_health/us-diplomats-in-cuba-suffered-innerear-damage-after-experiencing-mysterious-sound-or-pressure-doctors-say-abcid36139348/

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“Objective testing showed evidence of a balance disorder that affects the inner ear and a unique pattern of cognitive and behavioral dysfunction,” said Michael E. Hoffer, M.D., professor of otolaryngology and neurological surgery. “This cluster of auditory and neurological symptoms, along with associated psychological issues, does not resemble more classic traumatic brain injury (TBI) based on our team’s vast experience in this area.”

Dr. Hoffer was lead author of the study, “Acute Findings in an Acquired Neurosensory Dysfunction,” published today in the peer-reviewed journal Laryngoscope Investigative Otolaryngology. The Miller School study included a review of 25 individuals at the U.S. Embassy who reported a localized sensation of noise/pressure and 10 individuals who were roommates of those affected and did not experience the phenomenon.

“This is the first and only report of the acute presentation (seen shortly after exposure) in this unique group of patients,” Dr. Hoffer said. “Our findings are not biased or influenced by the effects of time, variable amounts of rehabilitation, workers’ compensation concerns, or media attention. It is an important contribution to this field, and these data will provide further insights into determining what happened.”

Carey D. Balaban, Ph.D., professor of otolaryngology at the University of Pittsburgh School of Medicine, was co-author of the study, along with the Miller School’s Hillary Snapp, Au.D., Ph.D., associate professor of otolaryngology and chief of Audiology; Bonnie E. Levin, Ph.D., professor of neurology and director of the Division of Neuropsychology; and James Buskirk, PT, SCS, a doctoral student.

“Understanding the acute symptoms is important in order to better define the clinical presentation which we hope will lead to more accurate diagnosis in future cases,” Dr. Levin said. “Furthermore, careful documentation of the initial injury pattern is needed to develop effective preventive and treatment strategies. We believe our findings bring to light the complexity of the acute clinical picture, which is best addressed by a team of researchers.”

The collaborative study shows the power of a large interdisciplinary team that spans specialties and universities,” said Dr. Balaban, who has studied the circuits to the brain relating to balance disorders, anxiety and migraines in patients at the University of Pittsburgh. “A holistic integrative approach is vital for understanding the scientific basis of this complex disorder.”

“This is a perfect example of how academic medicine brings together expertise and collaboration in the name of discovery and science,” said Henri R. Ford, M.D., MHA, dean and chief academic officer of the Miller School of Medicine.

The onset of symptoms

Beginning in late 2016 and continuing into 2017, a number of U.S. diplomats and family members stationed in Havana, Cuba, began to report complaints of sudden-onset dizziness, ear pain, and tinnitus. Most of the affected individuals reported hearing an unexplained noise before the symptoms began. They noted the sound was loud, localized, at a high frequency and could follow them throughout a room. Several individuals reported that if they went outside their front door, the noise immediately stopped. Others reported a sensation of pressure passing through their head and abdomen in certain parts of the room that could be relieved by moving a few feet away.

In February 2017, Dr. Hoffer, a former military officer with security clearance, was contacted by the U.S. State Department about an individual who reported hearing an odd noise followed by intense ear pain and tinnitus. By the next morning, the individual was dizzy and had mild cognitive issues, such as processing emails slowly and forgetfulness.

Evaluating the cases

Over the next few months, the Miller School team conducted evaluations of all individuals who suspected they were affected between 4 and 60 days after exposure, as well as a larger group of 105 embassy workers who denied any "exposure" to noise or a pressure sensation.

The evaluations were carefully coordinated and conducted by multidisciplinary medical teams from otolaryngology and neurology.

"Our broadly scoped team of 15 audiology and neurotology specialists draws on our advanced vestibular testing technology for diagnosis and treatment and management, thanks to the Miller School's longstanding investment in our clinical program," Dr. Snapp said.

All of the 25 individuals with symptoms noticed unsteadiness and features of cognitive impairment, according to the study. Dizziness (92 percent) and cognitive complaints (56 percent) were the most common symptoms. Formal testing revealed that 100 percent of individuals had an otolithic (balance) abnormality and evidence of cognitive dysfunction, as documented by a battery of standardized measures.

After the evaluations, a number of the patients were treated for balance, cognitive and emotional disorders.

"We reviewed options for therapeutic interventions to address their physical, mental and emotional issues," Dr. Levin said.

Considering the cause

While the Miller School study did not attempt to determine the cause of the symptoms in these U.S. Embassy residents, the authors noted that intense ultrasonic radiation can produce "a syndrome involving manifestations of nausea, headache, tinnitus, pain, dizziness, and fatigue," based on occupational health literature. "The exposure responsible for these findings is unknown," said the co-authors. "It would be imprudent to exclude any potential directed or non-directed energy sources at this time."

In their study, the authors recognized Kurt Yankaskas, program manager at the Office of Naval Research, for comments helping to clarify the work; Alexander Kiderman, Ph.D., chief technology officer at NKI, for designing the software and hardware used to analyze these patients; Constanza Pelusso, M.D., research director in the Department of Otolaryngology, for her help in filing all necessary patient research forms and reports; and Danierys Font for her assistance in scheduling all of the patients.

They also thanked Fred Telischi, M.D., MEE, chair of the Department of Otolaryngology, Anthony Etzel, M.D., vice chair of administration in the Department of Otolaryngology, and Ralph Sacco, M.D., MS, professor and chair of the Department of Neurology, as well as the audiologists, nurses and staff of the Department of Otolaryngology for their assistance in caring for these individuals.

URL:
http://med.miami.edu/news/university-of-miami-medical-team-reports-acute-findings-from-the-havana-emb

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3. Radicalism and Cultural Homelessness (minerva.defense.gov)

Dec. 12, 2018 — Events like the 2015 Paris attacks, the 2015 San Bernardino shootings, the 2016 Orlando Pulse Nightclub shooting, the 2013 Boston Marathon bombing, and others since are seared into our memories. While many details of these attacks were different, they do have a striking commonality: these attacks were perpetrated by immigrant residents or citizens of the targeted country. Such tragedies raise a puzzling question: what would make someone turn against their own country?

With violent extremist groups like ISIS recruiting Muslims in the West in alarming numbers, this is a question of both theoretical and practical importance that we sought to answer through our own research, published in Behavioral Science and Policy. In a survey of 198 Muslims in the United States, participants were asked about their experiences as religious and cultural minorities, including their feelings of exclusion or discrimination on the basis

of their religion. We also asked how they balanced their heritage identities with their American identities in order to see if these kinds of experiences were related to their feelings toward radical groups and causes.

To measure support for radicalism, we asked people how willing they would be to sacrifice themselves for an important cause. We also measured the extent to which participants held a radical interpretation of Islam. For example, we asked whether it is acceptable to engage in violent jihad. Finally, we asked people to read a description of a hypothetical radical group and tell us how much they liked the group and how much they would want to support it. This hypothetical group consisted of Muslims in the US who were upset about how Muslims were treated by society and would stop at nothing to protect Islam.

Overall, it is important to note that support for these indicators of extremism was very low, which is a reminder that the vast majority of Muslims do not hold radical views.

But some people felt marginalized and identified with neither the culture of their heritage nor the culture of their adopted country. Those torn between cultures also reported feeling ashamed, meaningless, and hopeless. They expressed an overall lack of significance in their lives or a feeling that they do not really matter. The more people's sense of self-worth was threatened, the more they expressed support for radicalism.

We described this group of respondents as "culturally homeless" when they did not practice the same customs or share the same values as others in their adopted culture, but also felt different from other people of their heritage.

Our findings are consistent with a theory in psychology that terrorists are looking for a way to find meaning in their lives. According to work by psychologist Arie Kruglanski, when people experience a loss to their sense of personal significance—for example, through being humiliated or disrespected—they seek out other outlets for creating meaning.

Extremists are very much aware of this and exploit these vulnerabilities to target Muslims whose sense of significance is low or threatened. Fundamentalist religious groups give these culturally homeless Muslims a sense of certainty, purpose, and structure.

For people who already feel culturally homeless, discrimination by their adopted society can make matters worse. In our data, people who said they had been excluded or discriminated against on the basis of their religion experienced a threat to their personal sense of significance. The negative effects of discrimination were the most damaging for people who already felt culturally homeless.

Our results suggest that cultivating anti-immigrant or anti-Islamic sentiment is deeply counterproductive. Anti-immigrant discourse is likely to fuel support for extremism, rather than squelch it.

These issues are not unique to the United States. Radicalization is now a global problem, so future research will need to examine whether the model examined in this study affects the dynamics of radicalization in countries in other parts of the world. For example, radicalization processes might be even more pronounced among individuals who feel marginalized or segregated in societies that have higher degrees of ethnocentrism and negative attitudes toward outsiders. As our research advances, we are exploring this phenomenon in another country dealing with integration challenges and homegrown radicalization: Germany.

In both Germany and the United States, most Muslims reported wanting to integrate their two cultures into their identity. Yet our American participants felt more integrated than did their German counterparts. This led us to ask, what aspects of the host country might facilitate or hinder integration of its immigrants?

We looked to a cultural dimension called "tightness-looseness." "Tight" societies expect more conformity to normative behavior, where norm breakers are subject to punishment. "Loose" societies do not have such strict expectations for behavioral conformity, and are more permissive toward norm-breaking. A 33-nation study found that Germany is considerably "tighter" than the United States and that tighter countries are less tolerant of outsiders. For example, tightness is associated with ethnocentrism and negative attitudes toward immigrants (Gelfand et al. 2011). From this we decided to examine the notion that there would be more support for radicalism in tight versus loose cultures in part due to lower immigrant integration.

Indeed, we found this to be the case. Our German participants expressed greater support for radicalism than did our American participants. Further analyses revealed this difference could be explained partly by the consequences of cultural tightness. German Muslims found their country to be tighter than did American Muslims, consistent with previous research on patterns of tightness-looseness across nations (Gelfand et al., 2011). Tightness was associated with the perception that the host society was closed-minded to cultural diversity. In turn, this was related to less successful integration. Finally, lower integration was associated with greater readiness to self-sacrifice and stronger endorsement of an extreme interpretation of Islam.

Taken together, our research has shown that immigrant identity processes are significant contributing factors to homegrown radicalization. It is important to avoid alienating at-risk individuals through engendering a sense of distrust and suspicion between the broader society and members of the Muslim community within.

There are examples where these concepts were successfully used to improve community security and stability. A jihadist rehabilitation program in Aarhus, Denmark supports police working with the Muslim community to help reintegrate foreign fighters and find ways for them to participate in Danish society without compromising their religious values.

This work points to a strategy for reducing homegrown radicalization: encouraging immigrants to participate in both of their cultures and curbing discrimination against Muslims. This strategy is beneficial to both immigrants' well-being and adopted cultures' political and community/social stability.

Associated Reading

Lyons-Padilla, Sarah, Michele J. Gelfand, Hedieh Mirahmadi, Mehreen Farooq, and Marieke van Egmond. 2016. Belonging Nowhere: Marginalization and Radicalization Risk among Muslim Immigrants. Behavioral Science and Policy. 1(1): 1-12.

Gelfand, Michele J., Jana L. Raver, Lisa Nishii, Lisa M. Leslie, Janetta Lun, Beng Chong Lim, Lili Duan, et al. 2011. Differences between Tight and Loose Cultures: A 33-Nation Study. Science. 332(6033): 1100-1104.

Biography

Sarah Lyons-Padilla received her PhD in Social, Decision-making and Organizational Science from the University of Maryland, College Park. She is now a Research Scientist at Stanford SPARQ: Social Psychological Answers to Real-world Questions, where she partners with practitioners in criminal justice, economic development, education, and health to solve problems using social science.

Michele J. Gelfand is a Distinguished University Professor at the University of Maryland and the author of Rule Makers, Rule Breakers: How Tight and Loose Cultures Wire Our World (2018). Her work uses field, experimental, computational, and neuroscientific methods to understand the evolution of culture and its consequences for human groups.

Associated Minerva Project

Motivational, Ideological, and Social Processes in Political Violence

Supporting Service Agency: Office of Naval Research

URL:
https://minerva.defense.gov/Owl-In-the-Olive-Tree/Owl_View/Article/1706681/radicalism-and-cultural-homelessness/

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4. This unusual nature-inspired robot is equally at home on land or in the water (digitaltrends.com)

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That's where an intriguing new robot created by the company Pliant Energy Systems switches things up. Not only is it pretty darn effective at maneuvering underwater, using a pair of servo-assisted silicone fins, but it can also turn these fins into "legs" to continue to travel while out of the pool. Heck, it can even move effectively on ice: A particularly tough surface for virtually anything to move on.

"Velox can use several modes of locomotion found in the animal kingdom using just one pair of fins," Benjamin "Pietro" Filardo, founder and CEO of Pliant, told Digital Trends. "These fins are best described as four-dimensional objects with a hyperbolic geometry that allows the robot to swim like a ray, crawl like a millipede, jet like a squid, and slide like a snake. A craft equipped with this system [gains] unprecedented freedom to travel through a range of environments in a single mission."

Velox is intended as a proof-of-concept demonstration platform. The work is supported by the U.S. Office of Naval Research, which is interested in exploring the potential of different types of robot. However, Filardo said that Pliant has commercialization in mind and is currently exploring potential partners.

"As an underwater vehicle, the robot's ability to turn on a dime and to reverse direction almost instantaneously make it ideal for something like coral reef inspection or dragon fish hunting, where you want to look around and between objects and maneuver quickly," he noted. "Potential value to polar missions is self-evident for purposes such as monitoring and filming wildlife, surveying ice-melt, and exploring other opportunities that will open up as the polar ice caps recede. One can also envisage Velox as an ice-rescue robot towing a rope and life buoy to a victim who has fallen through ice."

The research could additionally be used to create a range of specialty vehicles. For instance, its insights could be utilized to develop a large, human-operated amphibious vehicle able to travel over both water and ice, similar to a hovercraft, but minus the noise and blasting.

One thing's for sure: Wherever Velox goes next — both figuratively and literally — we're excited to follow it.

URL:
https://www.digitaltrends.com/cool-tech/pliant-velox-robot-water-land/

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5. How Mobility Solutions Are Transforming Military Tactical Operations & Driving Better Mission Outcomes (insights.samsung.com) [Command Master Chief Matt Matteson is quoted].

Tactical teams and special operators face formidable challenges in an increasingly distributed battlefield — including complex terrain, long engagement ranges between troops, and loss of communication with Command. In environments where adversaries and operational environments evolve quickly and every second counts, military personnel success and survival require situational awareness during all phases of the mission.

As a result, operators are relying more and more on the power of mobility solutions to make informed decisions that impact mission success. Mobile technologies are transforming mission operations in the tactical environment by providing seamless communication capabilities for less cost with a bigger impact on the battlefield.

Mobility Is Transforming the Tactical Environment

Mobility solutions are enabling the personnel through ruggedized devices and custom software solutions that deliver communications, navigation, mapping, surveillance, reconnaissance, battlefield coordination, geospatial information and more. All these capabilities can now be securely accessed in the palm of a service members hand, integrated into the uniform, or mounted on equipment to help them make better decisions in theater, faster.

How the Military Is Deploying Mobile Solutions to Drive Mission Advantage

Mobile solutions will drive new levels of tactical agility as we enter a new era of warfare by making traditional tactical capabilities more flexible on a mobile platform. For service members specifically, mobile technologies will deliver enhanced situational awareness on distributed battlefields, enable greater coordination and serve as a force multiplier for command and control decisions.

Mobility Delivers Enhanced Situational Awareness

Mobility platforms are already making inroads at the Department of Defense (DoD), enabling service members to achieve greater situational awareness (SA) beyond line-of-sight, conduct Blue Force Tracking, and manage command and control (C2) and battlefield intelligence, as well as enhance surveillance and reconnaissance communications.

The United States Army's PM Nett Warrior (NW) program is a leading example of how military leaders are adopting mobility to enhance such capabilities. NW aims to lower soldiers' combat load, reduce the logistical footprint, avoid friendly fire and more effectively execute combat missions through secure army network communications. Specifically, NW's optimized and integrated SA system capabilities connect dismounted leaders to the network through secure radio communications. Leaders can then pinpoint soldiers' locations by accessing georeferenced mapping imagery through a mobile digital display.

As a result, the U.S. Army has been able to achieve quick mission command coordination between warfighting functions — from intelligence to maneuver, fire, sustainment or protection. According to Maj. Matthew Bailey, executive officer, 3rd Squadron, 2nd Cavalry Regiment, "With Nett Warrior, the ability to plan and rehearse an entire operation in a decentralized environment is unmatched. … We can have five troops spread across multiple areas of operation and never need to bring people together for a face-to-face meeting."

The Army is further developing the NW program by fielding a new mapping engine, the Android Tactical Assault Kit (ATAK). The geospatial infrastructure application was originally built using NASA World Wind Mobile and today overlays mapping, site survey, radio controls, web browsing, chat and more. ATAK's single digital operational view delivers real-time SA, collaboration and C2 capabilities so service members better identify friendly troop locations to verify where to direct support.

ATAK is being used across military branches today. For example, in July 2018, the US Air Force's (USAF) 96th Security Forces Squadron (SFS) began using ATAK in their patrol cars. Soon, the 96th SFS became the testing area for what could become a new Air Force-wide base defense communication platform. ATAK's ability to deliver instant information is available to defenders on patrol, at an emergency or at the command and control hub, known as the base defense operations center (BDOC). ATAK works via cellular communication, GPS and a base network, managed by the Air Force Research-lab (AFRL), which acts as a hub linking the patrols and BDOC. Other non-ATAK functions, like vehicle and license check information, work virtually like a phone app. Word continues to spread across defense branches about ATAK's dependability and ease of use.

Mobility Enables Greater Battlefield Coordination and Agility

Mobile device-based tactical applications can enable service members to act more quickly than ever before. For instance, they can help service members when calling in fire support that directly supports land, maritime, amphibious and special operations forces to engage enemy forces, combat formations and facilities in pursuit of tactical and operational objectives. DoD operations requires complex communication environments with service members often being separated by tens or even hundreds of miles and moving in three dimensions with unknown orientations. In such situations, radios and traditional devices can fail when losing network or signal.

Mobile platforms, however, can provide seamless communication even in such complex tactical environments, equipped with greater bandwidth and portability, regardless of whether service members are operating from land, sea or sky.

U.S. Marine Corps' (USMC) Kinetic Integrated Low-cost Software Integrated Tactical Combat Handheld (KILSWITCH) is one example of such a battlefield solution. Designed to facilitate capabilities like real-time data sharing between both Joint Terminal Attack Controllers (JTACs) and overhead aircraft, forces can use KILSWITCH

to quickly call in coordinates and confirm support. As a result of having quicker access to better information, troops have been able to use KILSWITCH to deliver strikes in four minutes, instead of what used to take half an hour to coordinate and execute.

According to the Office of Naval Research (ONR)'s Command Master Chief Matt Matteson, this capability can deliver clear battlefield advantage: "Because the KILSWITCH surface danger zone (SDZ) tool is handheld and portable, service members can plan live-fire training while in the field versus from inside of a command center. They're able to walk the ground and see graphic representations of weaponry, which improves planning efficiency — especially when plans change suddenly."

Similarly, the US Marine Corps (USMC) is using mission-purposed handheld tablets to support the Target Handoff System (THS), a configuration that determines a target's location using embedded GPS technology and then digitally transmits the data to supporting arms elements. The THS automatically generates coordinates for supplied targets, then digitizes the data into a map on the smartphone to remove the need for manual output by a Marine.

The digital data is then transferred to the Fire Support Coordination Center, where they determine the proper approach of attack, so the mission can be quickly and effectively executed.

With GPS, real-time sharing and seamless communication capabilities, mobility can enable faster access to better information. Service members can then coordinate attacks more precisely, avoid enemy fire with more agility and more effectively achieve mission objectives.

Mobility as a Force Multiplier

DoD is currently looking at how mobile solutions can both better support troops in the field by empowering service members with access to tools that can make them more effective, as well as significantly improve safety by limiting the number of soldiers being put in harm's way.

For example, the USMC recently announced that it is reducing the size of its rifle squads from 13 to 12 men while maintaining effectiveness with the addition of new capabilities and gear including tablets and drones. As part of this effort, USMC is focusing on SEA DRAGON — a live-force experiment campaign designed to assess changes that new technologies and tablets bring to the battlefield, like addressing the threat of unmanned aerial systems (UAS) and serving as a force multiplier.

In an effort to increase the effectiveness of smaller forces, the Marine Corps Warfighting Lab successfully tested the ability to have a single Marine operate six drones in the air simultaneously from a single handheld tablet. The goal is to get the number up to 15 and see the small UAS stay in the air for longer periods of time. Capt. Matt Cornachio, a fires project officer with the Warfighting Lab's science and technology division said, "We're looking at having minimal operator burden. … It's having the machines do the work for you, so you give them intent and they operate."

Handheld devices as force multipliers can help troops in remote or hotly contested locations augment 60mm mortar fire with precision strikes. Overall, the Corps wants every rifle squad qualified to direct air, naval and artillery fire using these new mobile technologies, which enables them to take on added responsibilities — equipping even the smallest combat units to survive with better tools and trainings.

5G Will Transform Tactical Operations Across Smart Bases and Connected Commands

5G networks promise service members the ability to achieve anything on the battlefield, from any location. These capabilities are all accessible from the palm[s] of their hands, including complex data analytics insights, enhanced battlefield command and control and new levels of combat preparedness — topped off with operational efficiencies and streamlined costs. There are already a number of exciting use cases for the military, ranging from increased supply chain visibility to improved human and mission performance and enhanced combat training — with additional capabilities rapidly evolving to meet tactical needs.

5G Networks Increase Supply Chain Visibility and Control

Defense agencies can use 5G to increase supply chain visibility for missions requiring real-time asset visibility, inventory tracking and warehouse management. With 5G, mobile devices can be turned into enterprise-grade barcode scanners that are already connected into logistics systems and databases for real-time visibility. Flight line operations and maintenance teams in USAF, for example, can leverage tablets within a secure 5G network environment to view real-time inventory and schematics, better use spare parts, manage aircraft diagnostics solutions and more. USAF can also advance projects around Electronic Flight Bags (EFBs) and Electronic Knee Boards (EKBs) to minimize or eliminate paper use in cockpits. The safety and cost benefits of these types of mobile solutions add up: "For every pound of weight removed from the aircraft, you save a certain amount of fuel on a given sortie. For instance, if you remove 120 pounds of paper from every single sortie, we calculated the command would save about $780,000 per year in fuel cost within the mobility air forces," outlined Richard Quidgeon, AMC electronic flight bag requirements manager, in a 2017 release.

5G Networks Improve Human and Mission Performance

5G networks can enable real-time analytics and data collection through wearable sensors and technologies, ensuring soldiers can achieve peak health and performance on the battlefield. Recently, the Army doubled down on efforts to ensure service members are optimizing the performance triad (P3) of sleep, physical activity and nutrition — which ensures peak physical fitness, cognitive dominance, and emotional resilience. In conjunction with such efforts, the Army Research Institute of Environmental Medicine (USARIEM) strapped wearable sensors on soldiers from the 75th Ranger Regiment. The purpose of the study was to predict heat illness in soldiers and use real-time physiological status monitors, keeping track of soldiers' core and skin temperatures as well as heart rates. This will help researchers see how the body responds when healthy and when experiencing heat illness or higher levels of stress.

5G Networks Enable Higher Fidelity Immersive Training Technologies

DoD spends an estimated $14 billion or more per year on "synthetic" digital training that uses digital environments to teach and prepare personnel for real-life jobs and experiences as well as battlefield readiness. Rapid advancements like virtual reality (VR), augmented reality (AR) and mixed-reality (MR) technologies with 5G network connectivity will enable increasingly realistic, mobile-based simulations that help service members virtually navigate combat scenarios, maintenance crew learn repair techniques and medics treat patients in the field. This allows soldiers to minimize risk and wear and tear to equipment, and avoid the cost of putting a plane in the air, tank on the ground or ship in the sea.

Samsung's Robust Mobile Ecosystem for Supporting Tactical Operations

Samsung's mobile technologies powered by 5G networks deliver defense-grade security and are modernized, scalable and mission-ready for tactical environments. With these tactical technologies, service members can stay connected to their missions no matter where they are or what conditions they are in.

How Samsung Can Help Take Your Mission to the Edge

COTS Mobility Solutions: By delivering an ecosystem of cost-effective and customizable consumer off the shelf (COTS) mobility solutions that are scalable and affordable, military operators can achieve advanced endpoint security without sacrificing high performance.

Interoperability: Samsung's tactical offering keeps the service members connected to the objective wherever the mission takes them, with a tailored software suite that integrates with common tactical radios and peripherals used in mission-critical environments.

Defense-Grade Security: Knox is the mobile security platform chosen by agencies for classified use that secures devices down to the hardware, meeting and even exceeding the most stringent requirements for mission-critical environments. Certifications include CSfC, CC MDF PP, DoD APL, STIG FIPS 140-2 and IP68.

From DoD to federal law enforcement, leaders cannot afford to miss out on the new wave of mobile technologies that can transform critical tactical operations. Today's service members require mission-ready mobile solutions that are operationally ready, interoperable, secure and proven — so communications are seamless and secure when it

matters most.

Following are key solutions offered in the Samsung tactical suite:

Galaxy S9 Tactical Edition (TE): A preconfigured software suite backed by defense-grade security that interoperates seamlessly with tactical radio systems and applications. TE is enabling the military to address emerging threats, modernize mission operations and reimagine what's possible on the battlefield.

Tab S3: Equipped with Samsung Knox for defense-grade security, this tablet has an additional layer of security with fingerprint authentication. Service members can leverage Knox with customizable services to build solutions tailored to specific tactical missions and objectives, giving IT administrators seamless manageability.

Gear VR: Offers military personnel the opportunity to improve their skills and knowledge using inexpensive, untethered, fully mobile gear protected by military-grade security wherever they happen to be stationed. Users have access to on-demand training using headgear and sensors, enabling more participation and training to be delivered rapidly with 360-degree environments that provide combat experiences similar to live training but without the risk.

HARMAN C2: Samsung's HARMAN C2 solutions comprise audiovisual applications helping defense IT personnel and service members securely view and access critical data for the tactical mission, while validating its veracity. User-friendly interfaces make it easy for Command to focus on driving overarching mission outcomes while service members focus on the mission at hand.

Samsung Knox: A defense-grade security platform that bakes in data protection down to the hardware, Knox provides granular access to device features, security options, customization settings and more. Knox provides over 2,000 APIs for key management and two separate libraries of FIPS 140-2 compliant cryptographic algorithms, making it easy for the military to secure and customize any device in the mobile ecosystem for tactical applications. Technology serves more than ever as the front line of national security. Learn more about Samsung solutions for federal government and defense applications here.

URL:
https://insights.samsung.com/2018/12/13/how-mobility-solutions-are-transforming-military-tactical-operations-driving-better-mission-outcomes/

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